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FOREST SERVICE

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RESEARCH PROGRAM

April 1, 1942

Forest Management Project

List of Current or Incompleted Studies, with Notes
on Scope, Status, and Future Plans



R - INT
RESEARCH PROGRAM
F.M.-General

April 16, 1942.

To: Reed W. Bailey, Director
From: Edwin L. Mowat, Assistant Silviculturist
Subject: Project status notes

The accompanying "List of Current or Incompleted Studies, with Notes on Scope, Status, and Future Plans" is intended to serve as a reminder and reference list for those interested in or responsible for carrying on the forest management studies. It was prepared in part before the threat of suspension of the project, and I have completed it without reference to that or to the war situation. However, I believe that it, together with other notes and lists that I will prepare, should be very useful in presenting a picture of our program at this time and an indication of what should or could be done on the various studies.

The list is intended to be all-inclusive, that is, to cover all of the studies that are "active" in any sense or degree. A few "closed" studies are also mentioned to show their place in the sequence of investigations; in some cases, the data for such are still in the current file because of relation to other incompleted studies.

There is a very limited description of purposes and scope of the projects and almost no mention of actual findings, so that the outline is not very informative to anyone not familiar with our general program. Reference on any study can of course be made to the project status sheets for brief statements or to the working plans, progress reports, etc. in the files for full information. For some studies (such as the cooperative Wood Sample study) for which there are few or no formal plans or reports, more complete descriptions are given than for those with such plans. Thus the length of space devoted to any study is no key to its importance.

Prior to and in connection with making up the list, I have worked over the file material on most of the studies, inserted explanatory notes, completed minor compilations, made a number of file reports, memoranda of procedure, etc. Practically my full time this winter was devoted to this sort of work (Schopmeyer had been scheduled to do quite a share of it), so that I have but little to show in the way of new research results this year. The work was necessary, however, particularly in view of the suspension of the project. Some of it could have been avoided, or at least made much easier, if preceding project leaders and workers had given greater attention to making full systematic records of their studies. There is still some of this sort of work to be done; I hope to have everything in understandable form before I leave.

(I am holding original copy of List as working copy and for possible revision; will turn it in by July 1.)

Edwin L. Mowat

April 1, 1942

Forest Management Project

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SILVICULTURE

Harvest Cuttings

1. Permanent plots - methods-of-cutting

- a. Boise Basin Expt. Forest: Pine Creek: 7 plots (72 acres) due for remeasurement in 1943; established 1933, remeasured 1938. Portion of data used for Logging Damage report (1940); some of original data would still make report on utilization and on exact effect on stand structure of various cutting methods applied; largely compiled; not given high priority because of limited application.

Remeasurement data not compiled; being held for next remeasurement, after which compile and report on growth, etc. Reproduction transects examined annually; continue indefinitely; results to be compiled and incorporated in Reproduction report. Data should be copied on to office forms as soon as feasible.

Bannock Creek: 1 plot (6 acres), virgin, check plot to above; established 1935; remeasured 1940; due for remeasurement 1943; measurements and plans same as for above.

- b. Carpenter Creek: 3 plots (15 acres); established 1913; remeasured last 1941; 1931 remeasurements reported upon in 1934; another progress report after 1941; due for remeasurement 1946. Reproduction transects being examined annually; continue at least through period of intensive reproduction study (to 1945?).
- c. Ditch Creek (Salmon N.F.): 1 plot (5 acres); established 1908; remeasured last 1941; 1931 remeasurements reported upon in 1934; another progress report in preparation; due for remeasurement 1946. Reproduction transects examined every 5 years in connection with remeasurement.
- d. Big Pine Creek and Poorman Creek (Payette N.F.): 13 plots (74 acres); established 1913; remeasured 1931; report on growth published; partial remeasurement 1941; compilation and brief progress report when possible. Area to be cut about 1944; plans in relation to cutting and future of plots to be determined. Reproduction transects examined every 5 years; 4 every year.

- e. Moores Creek (Boise N.F., private land): 2 plots (10 acres); established 1932; destroyed by fire 1934; from methods-of-cutting standpoint, only value is utilization and original tree record, suitable for incorporation with Pine Creek plot data of similar sort, largely compiled. (See Pine Creek plots, above)

Reproduction transects transferred to reproduction-after-fire series; being examined annually during period of intensive reproduction study; have special value as furnishing historical pre-fire and post-fire record, so retain indefinitely, though need not examine frequently.

2. The "Cut-over Study"

An intensive survey of stand, reproduction, and vegetation conditions on Forest Service timber sale areas in Central Idaho, including measurement of growth, mortality, and changes since cutting. Field study in 1932, supplemented with Pine Creek timber survey of 1934. Covered sample areas near Pioneerville, Lowman, Cascade, and McCall, Idaho. Has been heavy compilation job, now down to final stages. Report is in preparation (rough draft 1/4 done); has first priority among major office jobs. Some data already released to Region, and additional material is in actual demand by administrative men. Will make major mimeographed (?) publication but of chief value within region and possibly by other workers in ponderosa pine.

Done: Curtis, J.D.
1950. INT Res Pap 23
Wheat, 1940. IF 38
247-255

3. Boise Basin Experimental Forest Management

- a. Barkbeetle surveys - annual survey (20% cruise) made of experimental forest 1935-1940; furnishes needed data on mortality and on progress of beetle infestation, and index to possible need of control measures. Field survey takes 2 men about a week; office 1 man 2 days. Desirable to continue indefinitely.
- b. Management plan for cuttings on Forest - includes usual management plan features and also working plans for all experimental work to be carried on in connection with cuttings. Have timber survey data compiled, and Hinkley made preliminary plan in 1935, but needs to be much more exhaustive, and experimental plans still hazy. Of high current priority because such research needed and present situation makes cuttings possible. When cutting begins, execution of plans will be a major activity.

Stand Improvement

1. Thinnings

- a. Sapling-pole stands: Experimental plots (25 in 5 blocks; total area, 12.5 acres), Bannock Creek; established 1934; remeasured 1939; remeasurements at 5-year intervals;

continue indefinitely. First report of operation and suggestions for thinning (for benefit of CCC, etc.) in 1935. Remeasurement data not compiled; should be compiled and progress report prepared. Annual examinations have showed insect and snow damage. Demonstration value.

- b. Thinning and improvement cuttings in 70-year-old stands - Station Area; about 10 acres treated, 1934-6-8. Sample plots #1 and 2, about 5 acres; established 1935 and 1936; remeasurements due, 1941 (may get in spring 1942), and at 5-year intervals. Demonstration value considerable. Continue remeasurement indefinitely. Further operations as time allows, with sample plots to measure seasonal, site, stand, or treatment differences. Should not allow to expand indefinitely and obligate time; keep plot work as minor project. Progress report after remeasurements.

2. Pruning

- a. Demonstration areas of pruning 1-log and 2-log lengths on crop trees, station area, (see Thinning Plots), stand chiefly about 70 years old. Begun 1934. May continue in future with further stand improvement work in young stands, but no obligation set up except tree remeasurement on thinned plots, and minor study of rate of healing of limb scars (calls for measurements or observations every few years on selected trees); latter is long-time study, but progress reports from time to time.
- b. Rate of Natural Pruning study - field work and most of compilation and analysis completed; Maki planned to write report for publication. Study to be closed with report.
- c. Tool-size study; time and cost of pruning as related to tools used, technique, size of tree, and character of tree as to size, number, and greenness of limbs. Rough compilations made and preliminary findings released. Needs further analysis and report, if value warrants. Study to be closed with report.

Silvics

1. Natural Reproduction of Ponderosa Pine (major study at present)

- a. Seed production and dissemination. (1) Cone crop tally on sample plot trees, annual since 1934; to show production by different sizes and classes of trees; planned to continue through 1944; compilation complete through 1938. (2) Study of quality of seed produced by different sizes and Dunning tree classes; field work in 1936 and 1940; then close this phase; analysis half done. (3) Seed dissemination (and "effective production") as measured by seed traps; 100 traps in place examined semi-annually since 1935; 100 more put out in 1940 for special study of distance of dissemination;

compilations up to date and results released currently; had planned continue to 1945 (10 years) to get yearly variations and trends; could discontinue earlier but does not obligate much field or office time after traps placed. (4) Cone development (a minor phase), carried since 1935, recently on reduced scale and now discontinued; value is in facilitating production estimate a year ahead based on trees with precise production record; most of compilation completed.

- b. Factors affecting germination, survival, and growth - intensive study of seedlings under semi-controlled and measured conditions in exclosures; main first-year observations in 1936, with check plantings and follow-ups since; field work essentially complete, compilations and analysis 1/3 complete; a few man-days field work in 1942; otherwise only office work remaining.
- c. "Competition study", really one phase of factor study dealing with the factor of competition by lower vegetation and overwood; developed from original factor study; listed separately because of its size and importance and continuing nature; plantings in 1938, 1939, 1940 and heavy natural seeding in 1941; principal results available within two years after planting, but planned to continue occasional observations for five years (to 1945 unless results show not worth while); no further plantings planned; report any time after 1942; need not await later inspections; preliminary compilations, except on physical factors, fairly well up to date, but still much correlation and analysis to be made. A few physical factor measurements, principally of soil temperature and moisture made each year. Forest soils in area analyzed.
- d. Measurement of germination, survival, and growth of seedlings under natural conditions in virgin, selectively cut, and burned areas. This phase known as "transect studies," as use of transects is chief sampling method. (1) Annual (or in good seed years, semi-annual) inspections of transects on permanent sample plots - see "Harvest Cuttings, Permanent Plots"; these intensive examinations begun in 1933-35 planned to continue 10 years (i.e. to about 1945) to get variety of years and trend. (2) Supplementary to these are extensive transects through virgin forest, which is inadequately sampled by permanent plot transect; one along seed trap line; same schedule of inspection. (3) Special studies of 1935 and 1937 crop of seedlings on all above transects; data compiled and office reports prepared. (4) Extensive transects in Elk Creek Burn examined annually to show after-fire trend; may largely abandon after 1944; not essential to continue now, but small job. Some related data on after-fire reproduction from transects in Boise Basin Burn (see "Fire Effects"). (5) Special study of seedlings in Elk Creek Burn in 1939 to supplement transect data, with better random design; data compiled, not fully analyzed, to be incorporated with other material for special

report on after-fire reproduction (fairly high priority).

(6) Unusual "catch" of seedlings and first-season survival on transects in 1941 makes special problem in study of further survival and development. (7) Temporary transects along seed trap lines in burned area established in 1941 to correlate seedling establishment with seed dissemination out from green timber; incidentally yield comparison of survival in burn with that in virgin and cut-over; to be discontinued in 1943, or when dissemination study complete.

- e. Root studies (relates chiefly to natural reproduction study, though could be considered independent silvical study).
(1) Intensive measurements of root development of ponderosa pine under natural conditions, seedlings 1 to 4 years old. (2) Comparative root development of planted and natural seedlings on same site, first year. Planned to carry study on to older seedlings and trees, but too time-consuming. Field work discontinued 1936; data compiled; some results extracted; needs full report and brief publication on present basis.

2. Phenology of Forest Trees and Associated Vegetation in Ponderosa Pine Type

Weekly observations and measurements through growing seasons, 1935-1940, of phenological events and current height growth of 6 tree species and 18 "key species" of grasses, weeds, and shrubs, also current diameter growth of trees, at 3 elevation zones on Boise Basin Experiment Forest. Climatic data for same stations; largely compiled. Phenological data mostly in raw form; some preliminary compilations to show seasonal tree growth. Field work reduced, 1939-40, discontinued, 1940. Information has value as background for other forest range research and possibly limited practical applications (such as certain plant development as key to fire danger). Correlations with climatic data not yet attempted. At least the data on tree growth should be analyzed and reported upon. Records for lower vegetation could be kept for reference or use in future range or other studies if no early report on same appears warranted. In general, study designed to provide data acceptable for statistical analysis.

3. The "Snow Tree" Study

A small incidental study of the effect of snow cover on the growth and development of young ponderosa pine trees. For five winters (1934-38) snow was kept shovelled from around three pole-size pines near headquarters at B.B.B.S. In 1939, borings made on these and three check trees and twig and needle samples collected for precise measurement and anatomical and chemical study. Latter study not made for lack of time (still have sample material). Study seems of academic interest but of doubtful practical application; might help to explain some regional differences in tree development. Desirable to complete and report study even if negative results, in view of work already done, but of low priority. (Might be assigned to student.)

REGENERATION

1. Seed studies (chiefly ponderosa pine)

A group of studies aimed to give new or localized information which would aid in seed collection, extraction, storage and other pre-planting practices. (Some phases overlap slightly with natural reproduction seed studies (see Silvics, 1, a, above); each contributes a little information to the other.)

- a. Seed "statistics" - data on cones per bushel, yield per tree, number and weight of seed per cone, per bushel, weight before and after de-winged, etc.; chiefly 1936 crop measurements, with checks for seasonal variation in 1937-39. Data compiled and analyzed; report in preparation.
- b. Relation of altitude, age of tree, and density of stand to seed yields, superficial character of cones and seed, viability of seed, and character of nursery seedlings. Seed collections from 150 trees, 1936; field work closed with seedling measurements, 1938. Data largely compiled and analyzed; report, in combination with "a" above, in preparation.
- c. Cone specific gravity as a seed maturity index. Measurements in 1936, with checks in 1937-40. Data compiled and analyzed; report published in Journal of Forestry, January, 1940. Study closed, but have possibility of extension of idea to prediction of maturity date, using same data, with small amount of work.
- d. Seed storage. Seven lots of seed stored under six conditions, differing chiefly in temperature, 1936. Germination tests periodically: 1937 (?), 1938, 1939, 1940 (some only partial); additional tests due, 1942, 1944. Study to be closed, 1944. Data to date partly compiled, results released; no formal publication until close of study.
- e. Methods of hastening germination - a preliminary and small-scale test of temperature and water-soaking treatments, 1939. Data largely compiled; to be reported (exact status uncertain), and closed with report. (Subject needs more comprehensive study than we are prepared to give it, in view of its relative importance here.)

2. Nursery studies (chiefly ponderosa pine)

Forest nursery work was undertaken at BBBS with several purposes in mind: (1) Develop and test nursery techniques applicable in regional nurseries; (2) Develop a form of planting stock better adapted to drought conditions of region; and (3) Grow ordinary planting stock of known local seed source and uniform nursery and handling treatment for field planting tests.

- a. Frequency-of-watering and season-of-sowing experiment (Fn-1). Sowings made, 1936-37; size, weight, etc. measurements, 1937, 1938. Samples transplanted, spring 1939; measurements, 1941. Intended to carry on to field planting of transplants, 1940 or 1941, but lacked time and labor; stock too large now. First-year results compiled, released in monthly report. Transplant survival and measurement data should be further analyzed for office report. Close study with report.
- b. Mulch and season-of-sowing experiment (Fn-2). Sowings made, 1936-37. Observations and germination and survival counts, 1937-38. Results compiled, released in monthly report. Stock used for root pruning and other nursery and field tests. Importance probably does not warrant formal report; thus study closed.
- c. Development of seedlings from individual tree seed sources - a nursery follow-up of "b" under "Seed studies." Seven beds sowed June 1937 with seed from each of 150 trees. Counts and measurements 1937 and possibly 1938. Any significant results to be incorporated with report on seed; study then closed.
- d. Root pruning. A root pruner for nursery beds was designed, constructed, and used; aimed to prune to greater depths (12"-15") than in other regions. Practice was successful, but no follow-up to determine effect on stock dimensions or form in nursery. (But see field root pruning tests.) Pruner turned over to Boise N.F.
- e. Thinning and top pruning. Some thinning practiced on several beds used in preceding studies; early results appear to be unmeasured or at least unrecorded. Specific test initiated in old mulch-series beds, 1940; measurements, fall, 1940; intended further measurements, including roots, 1941, but no time. Data should be compiled, analyzed, file report prepared. (Of low importance, but would take little time.)
- f. Miscellaneous species tests. One minor experiment, started in October 1937, tested relative development of ponderosa pine, lodgepole pine, and Douglas fir seedlings under ordinary nursery practice, in seedbeds and transplant beds. Records are meager, but seedlings still present in both seedbeds and transplant beds (transplanted spring, 1939). Should have at least observational report before stock destroyed (1942); study then closed. Small seedlings of 16 Pacific Northwest species, also Intermountain pinyon, and scotch pine and caragana from Russia, made in two beds, spring 1940; purpose, to test local adaptability in nursery and in field (hoped to develop arboretum eventually). To be transplanted, spring, 1942; those still showing possibilities to be field planted later. Observational progress report due 1942.

- g. Modifying root development by sowing in deep sand and by metal plates beneath soil. Small-scale test initiated October 1937. Germination not uniform; records not maintained. Study abandoned.
- h. Growing ponderosa pine stock for general field planting experiments. Stock from the Bannock nursery has been used in many field plantings, particularly that from the 1936 and 1937 sowings. To provide a stable source of supply, particularly for the date-of-planting tests (Fp-6), seedbeds were sowed in 1938, 1939, and 1940 (or the fall preceding those years), which would yield 2-1 stock ready in the fall of 1940, 1941, and 1942. Transplantings made on schedule in 1940 and 1941. Since the regional nurseries were in fairly stable production by 1940, it was decided that we would rely on them for future supplies. General policy to withdraw from nursery work and nursery studies.

3. Field planting and seeding (chiefly ponderosa pine)

Two general subdivisions: experiments dealing with planting nursery stock (designated Fp), and those dealing with direct seeding (designated Fps). Two studies, Fp-8 and Fp-10, involve both planting and seeding. General purpose is to develop practicable methods of reforestation that will insure satisfactory survival in central Idaho.

Planting

- a. Fp-1: Factors affecting survival and growth of planted ponderosa pine (relations to aspect, slope, vegetation, soil, etc., from which might deduce site selection and planting practices). Plantings on 30 plots in 1934-35-36; examinations to 1938; progress reports, 1935; machine compilation of data, 1937; to be analyzed, then study closed with final report.* (Possible value from one or more re-examinations to measure later survival, growth, injury, and competitive relationships in these old burn brushfields, but scattered locations and low survival make checking difficult.)
- b. Fp-2: Study of depth of planting and age and source of stock, ponderosa pine and Douglas-fir. Plantings on 31 plots, 1937; examinations and soil study, 1937; data compiled and analyzed; should be closed with brief report. (Further re-examinations on best plots would give general survival and growth data; probably little relation to original variables.)
- c. Fp-3: Study of grade of stock and method of planting (type of tool). Plantings on 8 plots, 1938; examinations, 1938-39; data compiled, need further analysis and report. (Further re-examinations - as for Fp-2).

* Partial results and some tentative conclusions from studies Fp-1 to Fp-9 are presented in Maki's preliminary summary report of February 27, 1939. There is still much to be gained from further analysis and report on several of the individual studies.

- d. Fp-4: Study of vegetative competition and grade of stock. Plantings on 15 small plots, 1938; examinations and measurements, 1938-39-41; need remeasurement 1942, 1943; data compiled, analyzed to date; progress report, 1941; probably close study with report after 1943 remeasurement.
- e. Fp-5: Tool-grade-species test, Utah. Plan prepared, 1938, never executed; still a desirable study, so plan being held in file.
- f. Fp-6: Study of year, season, and date of planting, source of stock, and aspect. First series of plantings on 3 plots, 1939; replantings on revised plan, 1940-41, scheduled for 1942; examinations 1939-40-41, scheduled for 1942-43; compilations up to date; progress report, 1941; probably close study with report after 1943 season.
- g. Fp-7: Study of source of stock and method of planting. Plantings (with timing tests) on 6 blocks, 1939; examinations 1939; progress reports 1939, 1941. No further field checks planned. Data need further analysis and final report.
- h. Fp-8: Study of planting vs. direct seeding, Boise Basin (involving variables of season of planting, grade and source of stock, size of scalp, use of fertilizer, and mode of seed protection). Successive plantings and seedings on 3 plots, 1938-39-40-41; examinations 1939-41; compilations nearly up to date; progress report, 1940; need re-examinations in 1942, 1943, 1945, and full report as of 1942; later, brief progress and closing reports if warranted.
- i. Fp-9: Study of effect of root pruning (involving variables of root length, season of planting, and source and age of stock). Plantings on 4 plots, fall 1939 and spring 1940; examinations, 1940; compilation and final report, 1942. Study closed, plots abandoned (low survival).
- j. Fp-9a: Study of effect of root pruning and shading (involving variables of root length, artificial shade, season of planting, and aspect). Plantings on 3 plots, fall 1937 and spring 1938; examinations 1938-39; examination, compilation, and progress or final report scheduled for 1942.
- k. Fp-9b: Study of effect of root pruning and stock grading (involving variables of root length, grade of stock, season and depth of planting, and aspect). Plantings on 3 plots, fall 1938; examination, 1939; abandoned, 1939 (revised to study designated Fp-9); closing report, 1942.
- l. Fp-10: Study of planting vs. direct seeding, Payette N.F. (involving variables of seed protection, season of planting, source of stock, and aspect). Plantings and seedings on 6 plots, fall 1940 and spring 1941; examinations, 1941; partial compilations and incomplete progress reports, 1941; need completion of progress report, examinations 1942, 1943, 1945, further progress and closing reports. (Good survival offers chance for study of release and spot thinning effects if time allows; not scheduled.)

- m. Fp-Misc.: Miscellaneous or minor studies (now all closed):
(1) Terrace planting, Davis County, Utah, 1935 and later: FM division took part in planting but FI division took over as part of Influences project there; not carried as a FM project now. (2) Driven-hole method of planting: planted two small plots, 1936; examined, 1937; final report, 1941. (3) Effect of surface color on survival: planting and seeding on one small plot, fall 1939 and spring 1940; examinations, 1940; closing report, 1942.

Seeding

- n. Fps-1: Comparison of screened and unscreened spots on Elk Creek transect. Planted, fall 1935; examinations, 1936-7-8; progress reports (which may be used as final reports), 1936 and 1941. Study closed, 1941.
- o. Fps-2: Test of use of tubular screens for rodent protection in direct seeding (involving variables of season of sowing, year, aspect, and site). Seedings on 12 plots, 1936-37; examinations, 1937-38; plots abandoned, 1938; progress report, 1938*; revised summary (closing) report, 1941.
- p. Fps-3: Study of three types of screens and effect of shading in direct seeding. Seedings on 3 plots, fall 1937; examinations, 1938; compilations and progress report, 1938; revised draft of plan and report, 1941; need re-examination for final establishment data, and closing report, 1942.
- q. Fps-4: Costs of direct seeding. Data obtained, 1937-38. Manuscript reports, 1938. Closed as a distinct study, but subject will have to be considered further in direct seeding work and additional data obtained when possible.
- r. Fps-5: Study of methods of and factors affecting direct seeding (involving variables of protection from rodents, size of screen protectors, time of screen removal, degree of scalping, use of fertilizer, year, aspect, and location). Seedings made on 9 plots, fall 1938, 1939, 1940; examinations, 1939-41; compilations and progress reports (which are practically final reports for 1938 and 1939 seedings), as of 1939 and 1940. Need few examinations (1942, 1943, and possibly later), compilations of some 1939 and all 1941 data (1942), progress reports on latter (1942). Study could be closed as far as initial establishment on present plots concerned, 1942; still need for more factor and methods studies.
- s. Fps-6: Test of direct seeding using poison for rodent control. Plans made for installation, fall 1941; postponed because of lack of labor. Plan good for any year; should be executed as soon as circumstances allow.
- t. Fps-Misc.: (1) Preliminary test of direct seeding of pinyon pine. Seedings on 30 spots in enclosures, fall 1939; examinations, 1940-41. Need examination and progress or final report, 1942; later inspections if survival warrants.

* A summary of results of this experiment, together with results of other studies in direct seeding to 1938, are in Maki's general report of Dec. 12, 1938: "Artificial Seeding of Tree Species in the Intermountain Region."

FOREST FIRE PROTECTION

1. Behavior

- a. Fuel moisture indicators (old designation, Pf, B-5). Use of wood cylinders and duff hygrometers supervised for Region 4, 1932-36; regional data currently compiled and reported to administration. This phase closed, but as service to Fire Control we have continued to "calibrate" wood cylinders and to offer a limited amount of advice and guidance on the subject through 1941. No longer necessary, so discontinued. 1942
- b. Study of effect of shade from wire screen on the moisture content of wood cylinders in Region 4 (involved also test of "litter cylinders" and duff hygrometers). Daily measurements, seasons of 1938-39-40; current computations made. Need complete analysis and report to close study (but doubtful whether warranted by present importance of subject).
- c. Trends of volatile content of evergreen foliage ("pine needle moisture study"). Field work, 1934-35-36; analysis and report, 1935. Inorganic nutrient determinations, 1934; rough draft report. Study closed, though not all data analyzed and reported upon. Formerly thought to warrant publication.

2. Effects

- a. Fire damage study, Boise Basin Burn. Extensive damage cruise, 1932; machine compilation, 1933 (?); brief reports published, 1935-36; initial damage phase thus closed, but data may have possibilities of yielding more information from further analysis and summary. Permanent plots (10) and transects for study of delayed loss, recovery, and other after-effects established 1932. Plots remeasured 1937; scheduled for remeasurement, 1942. Transects examined 1933, 1934, 1935, 1937, 1939; scheduled for examination, 1942. Some current results compiled and released informally. Need complete analysis and report after 1942, essentially closing study. Doubtful whether timber stand needs further study; further vegetational and reproduction changes on transects might warrant periodic reexaminations indefinitely to give historical record of fundamental value.

MENSURATION

1. Tree Studies

- a. Volume tables. (No active approved projects, but some work necessary incidental to silviculture studies, etc.) Local tables for ponderosa pine and Douglas-fir for Boise Basin constructed, 1934-35.

2. Stand Studies

- a. Yield of even-aged stands of ponderosa pine. Temporary plot study (interregional), 1934; closed. Planned to establish and maintain several permanent yield plots; only one (#S-3) at BBES established, 1936; scheduled for remeasurement at 5-year intervals (1941 meas. postponed to spring 1942); continue indefinitely. Unless project extended, could shift Plot S-3 to stand improvement category, as it also serves as a check plot to stand improvement plots S-1 and S-2 on station area.
- b. Yield of virgin ponderosa pine stands. (See "Harvest Cuttings"; the uncut permanent plots of the methods-of-cutting series have at times been classified under "Mensuration", but are not now considered as a distinct mensuration project.)

DENDROLOGY

1. Identification

- a. Wood samples of trees of the U. S. and Canada (Project I of the Department of Wood Technology, New York State College of Forestry). Station is an official cooperator, having sent several sets of sample material from Intermountain trees, and receiving sets of authenticated wood samples from time to time; some on display on second floor, others stored in SI locker and at BBES. Samples should be saved intact; future may bring chance for more effective use or display (general public display of all samples not of special value). Continue to supply new material as called for (have on hand requests for Cercocarpus, etc.; see correspondence).

FOREST AND RANGE INFLUENCES EFFECT OF COVER ON CLIMATE

1. Forests

- a. Effect upon snow storage and melting of variations in the forest cover and other factors in the ponderosa pine type of central Idaho (particularly the differences in forest cover resulting from partial or clear cuttings). Similar former study of "snow recession" on McCall plots closed with published report, 1935. For this follow-up study, snow measurements made on B.B.E.F., 1935-36-37; compilations by staff and WPA, 1936-1940; need final analysis and report. (Study has been considered part of Harvest Cuttings project, as its practical application is in methods of cutting, although under present scheme of project classification it belongs under "Influences".)

Edwin L. Mowat